

RTA	IFPKQYPIINFTTAGATVQSYTNFIRAVRGRLTTGADVRHEIPVLPNRVG	50
GELONIN	GLD-----TVSFSTKGATYITYVNFNLNRVCLKPEGN-SHGIPLLRKKCD	45
RTA	LPINQRFILVELSNHAELSVTLALDVTNAVYVVGYRAGNSAYFFHPDNQED	100
GELONIN	DP-GKCFVLVALSNDNGQLAEIAIDVTSVYVVGYQVRNRSYFF----KDA	90
RTA	AEAITHLFTDVQNRYYTFAFGGNYDRLEQLAGNLRENIELGNGLPEEAISA	150
GELONIN	PDAAYEGLFKNTIKTRLHFGGTYPSELEKAYRETTDLGIEPLRIGIKK	139
RTA	LYYYSTGGTQLPTLARSFIIICIOMISEAARFQYIEGEMRTRIRYNRRSAP	200
GELONIN	LDENAIIDNYKPTEIASSLLVVIOMVSEAAARFTFIENQIRNN--FQQRIRP	187
RTA	DPSVITLENSWGRSLTAIQESN-QGAFASPIQLQRRNGSKFSVYDVSILI	249
GELONIN	ANNTISLENKWGKLSFQIRTSANGMFSEAVELERANGKKYYVTAVDQVK	237
RTA	PIIALMVYRCAPPSSQF	267
GELONIN	PKIALLKFVDKDPK	251

RTA	I-----FPKQYPIINFITTAGATVQSYTNFIRAVGRLLTTGADVRHEIPV	44
BRIP	AAKMAKNVDKPLFTATFNVOASSAD-YATFIAGIRNKLNPAPHFSHNPV	49
RTA	LPN-RVGLPINQRFILVELSNHAELSVTLALDVTNAYVVGYRAGNSAYFF	93
BRIP	LPPVEPNVPPSRWFHVVLKASPTSAGLTLAIRADNIYLEGFKSSDGTWWE	99
RTA	HPDNQEDAEAITHLFTDVQNRYTFAFGGNYDRLEQLAGNLRENIELGNP	143
BRIP	LTPGLIPGATYV-----GFGGTYRDLLGDTDKL-TNVALGRQQ	136
RTA	LEEAISALY----YYSTGGTQLPTLARSFIICIQMISEAARFQ----YIE	185
BRIP	LADAVTALHGRTKADKASGPKQQQAREAVTTLVLMVNEATRFQTVSGFVA	186
RTA	GEMRTRIRYNRRSAPDPSVITLENSWGRLSTAIQESNQGAFASPIQLQRR	235
BRIP	GLLHPKAVEKSGKIGNEMKAQVNGWQDLSAALLKTDVKPPPGKSPAKFA	236
RTA	NGSKFSVDVSIILIPIIALMVYRCAP-----PPSSQF	267
BRIP	PIEKMGVRTAEQAANTLGILLFVEVPGGLTVAKALELFHASGGK	280

RTA	IFPKQYPIINF	TAGATVQSYTNF	IRAVRGR	LT	TGADVRHEIP	LPNRVG	50
MOM0II	D-----	VNFDL	STATAKYTKF	IEDFRATLP	FSHKV-YD	IPLLYSTIS	42
RTA	LPINORFIL	VELSNHAELSV	TLALDV	TNAYVVG	YRAGNSAYFF	HPDNQED	100
MOM0II	--DSRRFI	LLD	TSYAYETIS	VAIDVTN	VYVAYR	TRDVS	87
RTA	AEAITHL	FTDVQNR	YTFAGG	NYDRLEQL	AGNLREN	IELGNGLPEEAISA	150
MOM0II	PEAYN	ILFKGTR-KIT	LPYTGN	YENLQTA	AHKIRE	NIDLGLPALSSAITT	136
RTA	LYYSTGG	TQPTLARS	FI	CIOMISEA	ARFQYIEGEM	TRIRYNRRSAP	200
MOM0II	LFYNAQSA	-----	PSALLVLIQ	ITTA	EAARFKYIER	HVAKYVATNFK--P	179
RTA	DPSVIT	LENSWGR	LSTAI--	QESNOGAFAS	PIQLQRRNGSK	FSVYDVS--	246
MOM0II	NLAIIS	LENQWSALS	KQIFLAQ	NQGGKFR	NPVDLIKPT	GERFQVTNVDSD	229
RTA	ILIP	IIALMV	RCAPP	SSQF			267
MOM0II	VVKGN	IKLLNS	RASTADEN	FI	TMTLLGES	VVN	263

RTA	IFPKQYPIINF	TTAGATVQSYTNFIRAVRGR	LT	TGADVRHEIPVLPNRVG	50
LUFFIN	D-----	VRFSLSGSS	TSYSKFIGDLRKALPSNGTVYNLTILLSSASG	43	
RTA	LPINQRFILVELSNHAELSVTLALDVTNAYVVVGYRAGNSAYFFHHPDNQED	100			
LUFFIN	---	ASRYTLM	TLSNYDGKAITVAVDVSQLYIMGYLVNSTSYFF---	NESD	87
RTA	AEAITHLFTDVQNR	YTFAFGGNYDRLEQLAGNLRENI	ELGN	GPLEEAISA	150
LUFFIN	AKLASQYVFKGSTIV	TLPYSGNYEKLQTAAGKIREKI	PLGFPALDSALTT	137	
RTA	LYYSTGGTQ	PTLARSFII	CIOMISEAARFQYIEGEMR	TRIRYNRRSAP	200
LUFFIN	IFHYDSTAA----	AAFLVILQTTAEASR	FKYIEGQIIERI--	SKNQVP	180
RTA	DPSVITLENS-WGR	LSTAIQ--	ESNQGA	FASPIQLORRNGSKFSVYD	VSI 247
LUFFIN	SLATISLENSLWSALS	KQIQ	LAQTNGT	FKTPVVTDDKQQRVEIT	NVTS 230
RTA	LIP	IIALMVYRCAPP	SSQF	267	
LUFFIN	KVVTK	NIQLLLNYKONVA	248		

RTA	IFPKQYPIINF	TAGATVQSYTNF	IRAVRGRLTTG	ADVRHEIPVLPNRVG	50
TRICHO	D-----	VSFRLSGATSSSYGVFISNLRKALPNERKL-YDIPLL--RSS			40
RTA	LPINORFILVELSNHAE	SVTLALDVTNAYVVGYRAGNSAYFFHHPDNQED			100
TRICHO	LPGSORYALIH	LTNYADETISVAIDVTNVYIMGYRAGDTSYFF--NEASA			88
RTA	AEAITHLFTDVQNR	YTFAGGNYDRLEQLAGNLRENIELGNGLPEEAISA			150
TRICHO	TEAKYVFKDAMRK	VTLPYSGNYERLQTAAGKIRENIPGLPALDSAITT			138
RTA	LYYSTGGTQLPTLARS	FIICIMISEAARFOYIEGEMRTRIRYNRRSAP			200
TRICHO	LFYYNANSA----	ASALMVLIQSTSEAAARYKFIEQQIGKRV--DKTFLP			181
RTA	DPSVITLENSWGR	LSTAIQ--ESNQGAFASPIQLORRNGSKFSVYDV--S			246
TRICHO	SLAIISLENSWS	ALSKQIQIASTNNGQFESPVVLINAGNQRVTTITNVDAG			231
RTA	ILIP	IIALMVRCAPPSSQF			267
TRICHO	VVTSN	IALLLNRNNMA			247

RTA	IFPKQYPIINFTTAGATVQSYTNFIRAVRGRLTTGADVRHEIPVLPNRVG	50
MOMOI	D-----VSFRLSGADPRSYGMFIKDLRNALPFREKVYNIPLLLPSVSG	43
	* * *	
RTA	LPINQRFILVELSNHAELSVTLALDVTNAYVVVGYRAGNSAYFFHDPNQED	100
MOMOI	---AGRYLLMHLFNYDGKTTITVAVDVTNVYIMGYLADTTSYFFNEPAAEL	90
	* * *	
RTA	AEAITHLFTDVONRYTFAFGGNYDRLEQLAGNLRENIELGNGLPEEAISA	150
MOMOI	ASQ--YVFRDARRKITLPYSGNYERLQIAAGKPREKIPIGLPALDSAIST	138
	* * *	
RTA	LYYSTGGTQLPTLARSFIICIMISEAARFQYIEGEMRTRIRYNRRSAP	200
MOMOI	LLHYDSTAA-----AGALLVLIQTIAEAARFKYIEQQIQERA--YRDEVP	181
	* * *	
RTA	DPSVITLENSWGRLSTAIQ--ESNQGAFASPIQLORRNGSKFSVYDVSIL	248
MOMOI	SLATISLENSWSGLSKQIQLAQGNNGIFRTPIVLDNKGNRVQITNVTSK	231
	* * *	
RTA	IPIIALMVY-----RCAPPPSSQF	267
MOMOI	VVTSNIQLLLNTRNIAEGDNGDVSTTHGFSST	263

RTA	IFPKQYPIINFTTAGATVQSYTNFIRAVRGRLTTGADVRHEIPVLPNRVG	50
MAP	A-PTLETIASLDLNNPT--TYLSFITNIRTKVADKTE-----OCTIQKIS	42
RTA	LPINQRFILVELSNHAELSVTLALDVTNAYVVGYRA---GNSAYFFHPDN	97
MAP	KTFTQRYSIDLIVSSTQKITLAIDMADLYVLGYSDIANNKGRAFFFKDV	92
RTA	QEDAEAITHLFTDVQNRYTFAFGGNYDRLEQLAGNLRENIELGNPLEEA	147
MAP	TEAVANNFFPGATGTNRIKLTFTGSYGDEK-NGGLRKDNPLGIFRLENS	141
RTA	ISALYYYSTGGTQLPTLARSFIICIQMISEAARFQYIEGEMRTRIRYNRR	197
MAP	IVNIY---GKAGDVKKQAKFFLLAIQMVSEAAARFKYI-SDKIPSEKYEE-	186
RTA	SAPDPSVITLENSWGRSLTAIQESNQGAFASPIQLORRNGSKFSVYDVSI	247
MAP	VTVDEYMTALENNWAKLSTAVYNSKPSTTTATKCQLATSPVTISPWIFKT	236
RTA	LIPIIALMVYRCAPPPSSQF	267
MAP	VEEIKLVMGLLKSS	250

RTA IFPKQYPIINFITTAGATVQSYTNFIRAVRGRLLTTGADVRRHEIPVLPNRVG 50

PAPS I-----NTITFDAGNATINKYATFMESLRNEAKDPSLKCYGIPMLPNTNS 45

RTA LPINORFILVELSNHAELSVTLALDVTNAYVVGYRAGNSA-----YFFHP 95

PAPS ---TIKYLVLKLGASLKTITLMLRRNNLYVMGYSDPYDNKCRYHIFNDI 92

RTA DNQEDAEAITHLFTDVQNRYT--FAFGGNYDRLEQLAG-NLRENIELGNG 142

PAPS KGTEYSDVENTLCPSSNPRVAKPINYNGLYPTLEKKAGVTSRNEVOLGIQ 142

RTA PLEEAISALYYSTGGTQLPTLARSFIIQIMISEAARFQYIEGEMRTI 192

PAPS ILSSDIGKI--SGQGSFTEKIEAKFLLVAIQMVSEARFKYIENQVKTN- 189

RTA RYNRRSAPDPSVITLENSWGRLLSTAIQESNQGAFASPIQLORRRNGSKFSV 242

PAPS -FNRDFSPNDKVLDEENWGKISTAIHNSKNGALPKPLELKNADGTKWIV 238

RTA YDVSILIPIIALMVYRCAPPPSSQF 267

PAPS LRVDEIKPDVGLLNY--VNGTCOAT 261



RTA	IFPKQYPIINF	TTAGATVQSYTNF	IRAVRGRLTT	GADVRHEIPVLPNRVG	50
SAP6	V-----	TSITLDLVNPTAQ	QYSSFVDKIRNNVKDPNLKYGGTDI	--AVIG	43
RTA	LPINQRFILVELSN	HAELSVTLALDVTNAYVVG	YRAGNS-----	AYFFHP	95
SAP6	PPSKEKFLRINFQSSRG-	TVSLGLKRDNL	YVVAYLAMDN	TNVNRAYYFRS	92
RTA	DNQEDAEAI	THLFTDVQNR	YTFAGGNYDRLEQ-----	LAGNLRNIELG	140
SAP6	EITSAESTALF	PEAT	TANQKALEYTEDYQ	SIEKNAQITQGDQSRKELGLG	142
RTA	NGPLEEAI	SALYYSTGGTQLPTLARSFI	ICIOMISEAARFQYIEGEMRT	190	
SAP6	IDLLSTSM	EAV---	NKKARVVKDEARFLLIAIOMTAE	AARFRYIQNLVIK	189
RTA	RIRYNRRSAPDPSVIT	LENSWGRLSTAI-QESNQ	GFASPIQLORRNGSK	239	
SAP6	N--FPNKF	SENKVIOFEVNWKKISTAI	YGDAKNGVFNKD	YDFGFGKVRQ	237
RTA	FSVYDVSIL	IIPII	ALMVYRCAPPSSQF	267	
SAP6	VKDLOMGLL-----	MYLGKPKSSNEAN		259	



[illegible]

FIG. 10B

\$H65K-1  
 AGT CGT CGA CAC GAT GGA CAT GAG GAC CCC TGC TCA GTT TCT TGG CAT CCT CCT ACT CTG GTT  
 TCC AGG TAT CAA ATG TGA CAT CCA GAT GAC TCA GT

HUH-K1  
 TGA CTC GCC CGG CAA GTG ATA GTG ACT CTG TCT CCC AGA CAT GCA GAC ATG GAA GAT GAG GAC  
 TGA GTC ATC TGG ATG TC

HUH-K2  
 TCA CTT GCC GGG CGA GTC AGG ACA TTA ATA GCT ATT TAA GCT GGT TCC AGC AGA AAC CAG GGA  
 AAT CTC CTA AGA CCC T

HUH-K3  
 GAT CCA CTG CCA CTG AAC CTT GAT GGG ACC CCA TCT ACC AAT CTG TTT GCA CGA TAG ATC AGG  
 GTC TTA GGA GAT TTC C

HUH-K4  
 GGT TCA GTG GCA GTG GAT CTG GGA CAG ATT ATA CTC TCA CCA TCA GCA GCC TGC AAT ATG AAG  
 ATT TTG GAA TTT ATT ATT G

HUH-K5  
 GTT TGA TTT CAA GCT TGG TGC CTC CAC CGA ACG TCC ACG GAG ACT CAT CAT ACT GTT GAC AAT  
 AAT AAA TTC CAA AAT CTT C

HUH-G1  
 TGT CGA CAT CAT GGC TTG GGT GTG GAC CTT GCT ATT CCT GAT GGC AGC TGC CCA AAG TGC CCA  
 AGC ACA GAT CCA GTT GGT GCA G

HUH-G2  
 AAG GTA TAC CCA GAA GCT GCG CAG GAG ATT CTG ACG GAC CCT CCA GGC TTC TTC AGG CCA GGT  
 CCA GAC TGC ACC AAC TGG ATC T

FIG. 11A

HUH-G3  
 GCA GCT TCT GGG TAT ACC TTC ACA AAC TAT GGA ATG AAC TGG GTG AAG CAG GCT CCA GGA AAG  
 GGT TTA AGG TGG ATG GGC TGG

HUH-G4  
 AAA GAG AAG GTA AAC CGT CCC TTG AAG TC A TCA GCA TAT GTT GGC TCT CCA GTG TGG GTG TTT  
 ATC CAG CCC ATC CAC CTT AAA C

HUH-G5  
 GAC GGT TTA CCT TCT TTT TGG ACA CGT CTA AGT GCA CTG CCT ATT TAC AGA TCA ACA GCCTCA GAG  
 CCG AGG ACA CGG CTA CAT

HUH-G6  
 AGG AGA CGG TGA CCG TGG TCC CTT GGC CCC AGA CAT CGA AGT ACC AGT AAC CCC GTC TTG  
 TAC AGA AAT ATG TAG CCG TGT CCT CGG C

H65G-2S  
 ACT AGT GTC GAC ATC ATG GCT TGG GT

H65-G2  
 GAG GAG ACG GTG ACC GTG GT

H65K-2S  
 AGT CGT CGA CAC GAT GGA CAT GAG GAC

JK1-HindIII  
 GTT TGA TTT CAA GCT TGG TGC

FIG. 11B

pos	10	20	30	40	50
EU	DIQMTQS	PSTLSASVGD	RVTITCRASQS	IN TWLAWYQQKPGKAPKLLMY	KAS
hK1	DIQMTQS	PSSLSASVGD	RVTITCrASQx	Is xYLxWYQQKPGkAPkLIY	aAS
TAC	QIVLTQS	PAIMSASPG	KEKVTITCSASS	IS YMHWFQQKPGTSPKLWIY	TTS
bind	+-++++	O+++++O+++++	+-+--	---O++O+++++--	---
bury	+--+--+	O++O+-+--+	+-+--+	++--=O=++O=++--	+++
mod	•••••	••••••••••	•••••	•••••	
M/H	H HM	HHM M HH	h M	M MM M hM M	MM
prop	DIQLTQS	PSSMSASPG	DRV'TITCRASS	IS YMHWFQQKPGKSPKLWIY	T'TS
Que	DIQMTQS	PSTLSASVGD	RVTITCSASS	IS YMHWFQQKPGKAPKLLIY	T'TS

  

pos	60	70	80	90	100
EU	SLESGVPSR	FIGSGSGTE	FTLTISLQPD	DFATYYCQYNSDS	KM FGQGTKV EVK
hK1	xLxsgVPSR	FsGSGSGTx	FTLTISsLQ	peDFATYYCqqyxxP	xt FGqGTKv eik
TAC	NLASGVPAR	FSGSGSGTS	YSLTISRME	AEADAATYYCHQRSTYP	LT FGSGTKL ELK
bind	-+OO++O++	+-+--++	-+-----	-O O+++++	+++
bury	++O+-+O+-	++O+O++	-+--+--+	++--++	++
mod	•••••	•••••	••••••••••	•••••	•••••
M/H	M M H	M m	MH hMHm h	M MMM	M h M m
prop	NLASGVPSR	FSGSGSGTS	YTLTISSMQ	AEDFATYYCHQRSTYP	LT FGQGTKL ELK
Que	NLASGVPAR	FSGSGSGTE	FTLTISLQPD	DFATYYCHQRSTYP	LT FGQGTKV EVK

FIG. 12A

